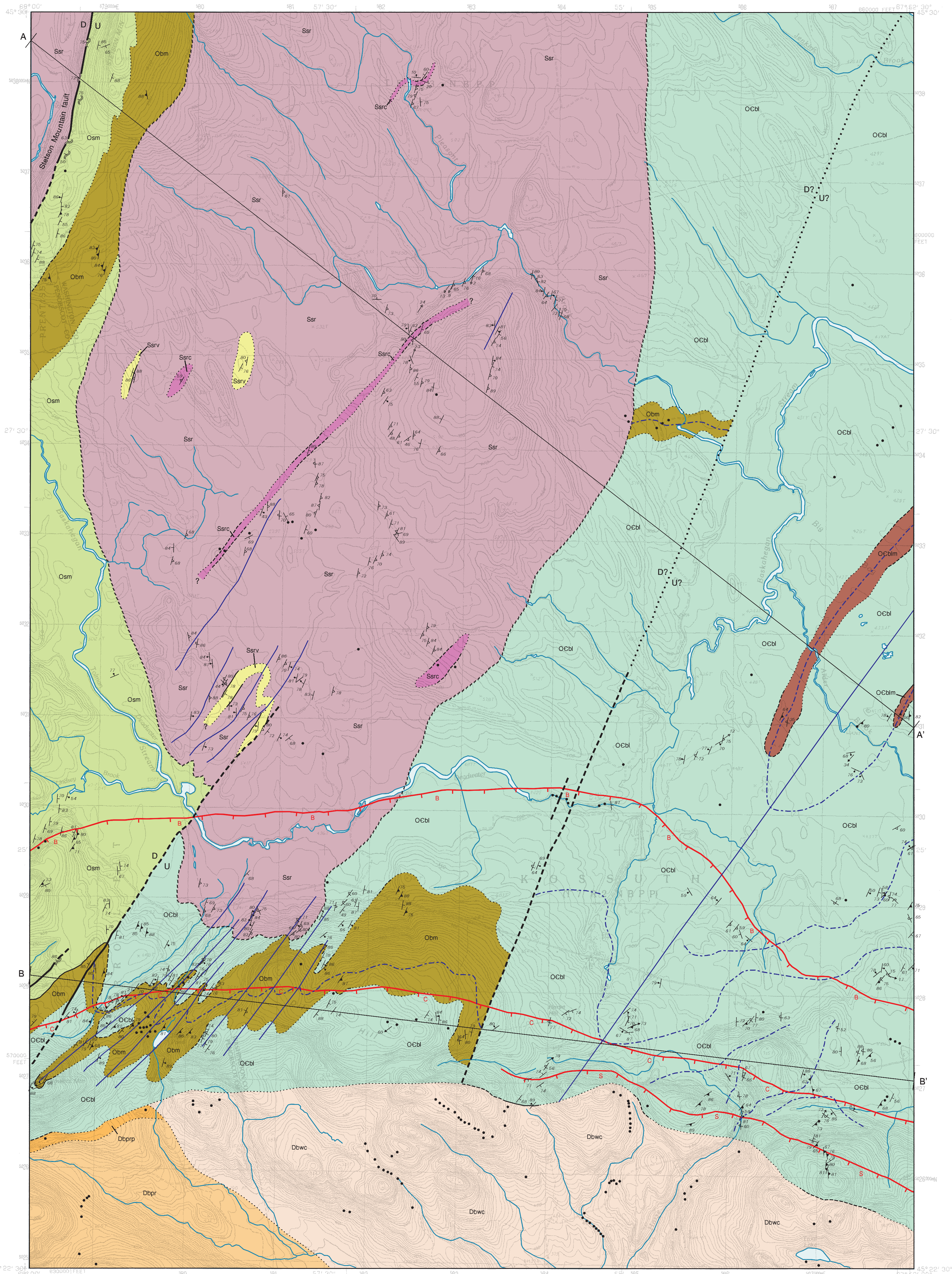


Bedrock Geology

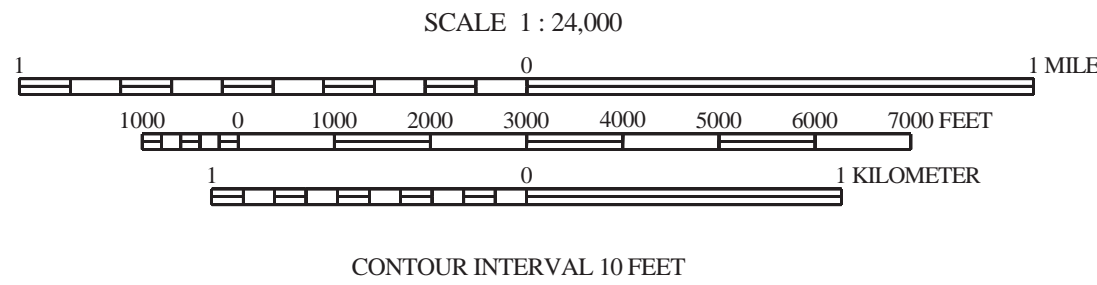


SOURCES OF INFORMATION

Bedrock geologic mapping by Allan Ludman completed during the 1999 field season.



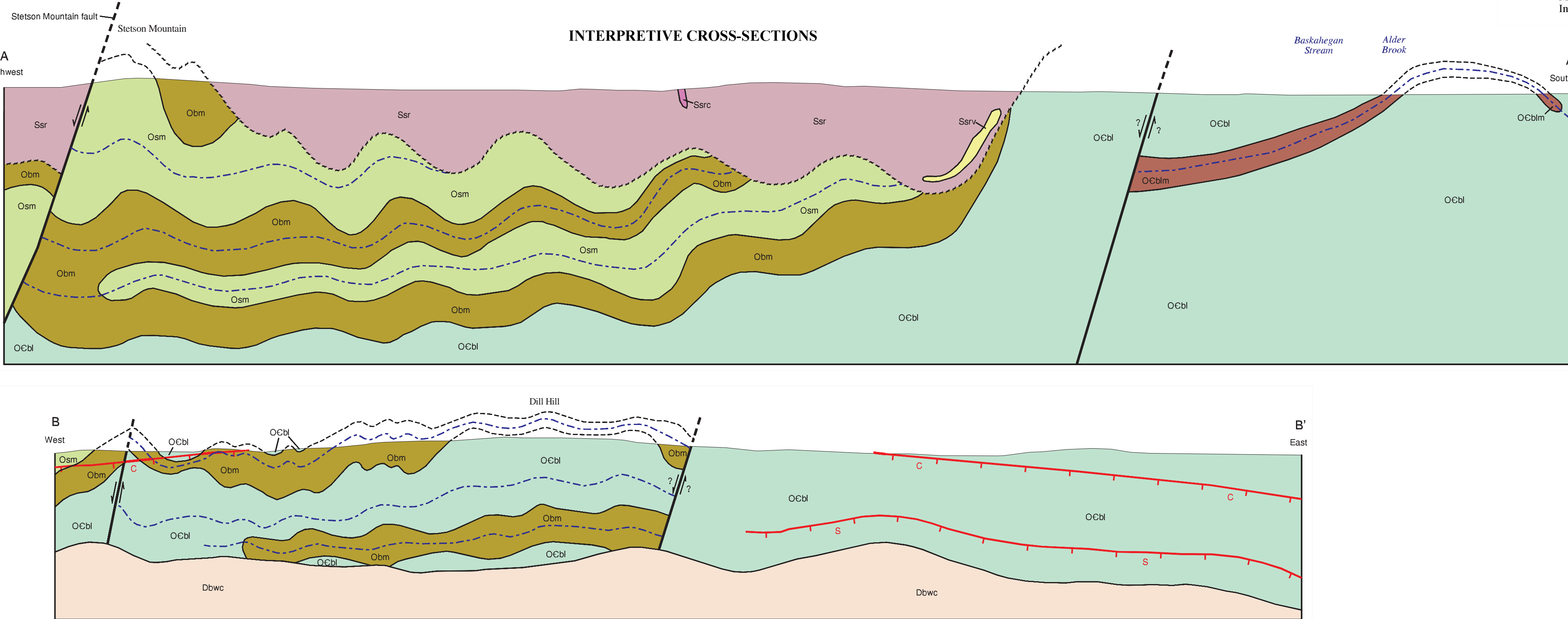
Quadrangle Location



Topographic base from U.S. Geological Survey Dill Hill quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic maps.

The use of industry, firm, or local government names on this map is for location purposes only and does not imply responsibility for any present or potential effects on the natural resources.

INTERPRETIVE CROSS-SECTIONS



Dill Hill Quadrangle, Maine

Bedrock geologic mapping by

Allan Ludman

Geologic editing by:

Henry N. Berry IV

Digital cartography by:

Robert A. Johnston

Robert G. Marvinney

State Geologist

Cartographic design and editing by:

Robert D. Tucker

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Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333

Telephone: 207-287-2801 E-mail: mgs@maine.gov

Home page: <http://www.maine.gov/doc/nrimc/nrimc.htm>

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EXPLANATION OF UNITS

INTRUSIVE ROCKS

Bottle Lake Complex

Devonian

Pasadumkeag River pluton. Coarse grained biotite-hornblende granite and quartz monzonite with gray microcline. **Dbprp:** porphyritic border phase. Age is 380 ± 5 based on U-Pb zircon and Rb-Sr whole-rock analyses (Ayuso and others, 1984).

Whitney Cove pluton. Medium-grained to coarse-grained biotite granite with pink microcline. Ferromagnesian content generally 10-15%. Age is 380 ± 5 Ma based on U-Pb zircon and Rb-Sr whole-rock analyses (Ayuso and others, 1984).

STRATIFIED ROCKS

AROOSTOOK-MATAPEdia TERRANE

Prentiss Group

Silurian(?)

Sar **Sam Rowe Ridge Formation.** Thinly and rhythmically interbedded sandstone and gray pelite in roughly equal proportions. Beds are mostly 5-15 cm thick, but range from 2 cm to almost a meter. Graded beds are ubiquitous. The sandstone is fine-grained to medium-grained argillaceous wacke that ranges in composition from quartz-feldspathic to highly feldspathic. Pelite is medium-gray to dark-gray. Small amounts of ankerite or siderite are commonly present in both sandstone and pelite, but calcareous rocks are rare.

Ssrc **Polymictic conglomerate.** Pebble to small cobble conglomerate with rounded clasts of felsic volcanic rock and quartzose sandstone. The matrix is generally silt or sand, and some is highly calcareous. Many clasts are derived from the Stetson Mountain and Baskahegan Lake Formations (Hopeck, 1994). In addition to the mapped units, minor amounts of conglomerate are scattered throughout the formation.

Ssrv **Fragmental volcanic and volcanoclastic rocks.** Grayish-green ashfall tuff. Similar to rocks of the Stetson Mountain Formation.

UNCONFORMITY

MIRAMICHI TERRANE

Ordovician(?)

Osm **Stetson Mountain Formation.** Gray or green, fine-grained to cryptocrystalline ashfall tuffs, medium-grained ashfall tuffs, minor volcanic agglomerates, black shale, and manganeseiferous chert or mudstone. Interpreted to be conformable with the Bowers Mountain Formation.

Otm **Bowers Mountain Formation.** Thinly bedded pelite with subordinate thin quartz arenite interbeds. Pelite in the lower part of the formation is predominantly rusty-weathering, black, sulfidic and carbonaceous, whereas in the upper part of the formation gray-weathering, non-sulfidic, non-carbonaceous to slightly carbonaceous pelite is more abundant. Internal stratigraphic relationships are obscured by shearing, however, frustrating efforts to define upper and lower members. Massive beds of quartz arenite 15 to 50 cm thick are found throughout the formation. The Bowers Mountain is interpreted to be conformable with the Baskahegan Lake Formation.

Lower Ordovician(?)—Cambrian(?)

Ocbi **Baskahegan Lake Formation.** Bluish-gray to grayish-green quartzose or quartz-feldspathic wacke and arenite in thick massive beds, or in Bouma sequences with subordinate gray, green, or maroon pelite. Both massive and graded beds are common. A penetrative pressure-solution cleavage is well developed. Massive beds, including some coarser beds of granule conglomerate, range to greater than 2 meters thick. Thinly interbedded pin-striped siltstone and mudstone occur in graded beds down to 2-5 cm in thickness. All rocks are metamorphosed to hornfels in contact aureole of the Bottle Lake pluton.

Ocbim **Maroon Lower Member.** Same rock types as the rest of the formation, except for deep red color in both wacke and pelite, caused by a greater proportion of matrix hematite. This unit is recognized only in chloritic-grade exposures, presumably because the hematite is not preserved at higher metamorphic grade. Primary facing indicators along the contact show that this member is stratigraphically below the green and gray rocks of the rest of the formation. Base of the unit is not exposed.

EXPLANATION OF LINES

--- Stratigraphic or intrusive contact (well located, approximately located, inferred).

--- Inferred unconformity, possibly modified by thrust and normal faulting.

--- High angle fault (well located, approximately located, inferred). Relative motion indicated by letters: U = upthrown block, D = downthrown block.

--- Contact metamorphic isograd related to the Bottle Lake Complex. Index mineral labeled on higher-grade side of line: biotite (B), cordierite (C), sillimanite (S). Some rocks in the cordierite zone also contain andalusite porphyroblasts. Sillimanite isograd has not been delineated in the southwestern part of the map.

--- Inferred trace of F1 hinge surface. Identified by reversals in facing direction of bedding. Variable in orientation due to F2 deformation. Restricted to units older than the Sam Rowe Ridge Formation.

--- Inferred trace of F2 hinge surface. Identified by pattern of mapped contacts and by reversals in facing direction of bedding. Generally north to northeast-trending, upright folds.

A—A' Line of cross-section.

EXPLANATION OF SYMBOLS

- Outcrop of mapped unit, no structural data given.
- Strike and dip of bedding. Stratigraphic tops determined from relic primary features where indicated (tops unknown, tops upward, overturned).
- Strike and dip of first cleavage. Spaced cleavage defined by mineral preferred orientation. Axial plane fabric of first generation folds.
- Strike and dip of second cleavage. Predominant planar fabric in homogeneous pelitic rocks, particularly in the Sam Rowe Ridge Formation.
- Strike and dip of mylonitic foliation. A penetrative foliation related to the Stetson Mountain fault in the northwest corner of the map area.
- Trend and plunge of first generation (F1) minor fold.
- Trend and plunge of second generation (F2) minor fold.
- Trend and plunge of second generation intersection lineation.

REFERENCES CITED

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Hopeck, J., 1994, Post-Caradocian strata of the Miramichi anticlinorium and their relation to the Aroostook-Matapedia belt. In Hanson, L. S. (editor), *Guidebook to field trips in north-central Maine: New England Intercollegiate Geological Conference, 85th annual meeting*, Millinocket, Maine, p. 43-59.

GEOLOGIC TIME SCALE

Geologic Age	Absolute Age*
Cenozoic Era	0-65
Mesozoic Era	Cretaceous Period 65-145 Jurassic Period 145-200 Triassic Period 200-253
Paleozoic Era	Permian Period 253-300 Carboniferous Period 300-360 Devonian Period 360-418 Silurian Period 418-443 Ordovician Period 443-489 Cambrian Period 489-544
Precambrian time	Older than 544

* In millions of years before present. (Okulitch, A. V., 2002, *Échelle des temps géologiques*, 2002; Commission géologique du Canada, *Dossier Public 04040* (Série nationale des sciences de la Terre, Atlas géologique) - RÉVISION.)